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ABSTRACT

The classroom behavior and academic achievement of 32 educable retarded children (EMR) with a mean age of 11.24 years were studied in two types of open classrooms, graded and multi-age, and compared to that in a special education class. The three different instructional environments were found to generate characteristically different patterns of classroom behavior over a four-month interval as measured by time-sampling procedures. The results generally supported the assumption that open-space, integrated classrooms facilitate greater social interaction on the part of EMR students. The frequency of task-relevant behavior was higher in the special education class compared to that found in the two open classrooms. All three groups of EMR children made comparable gains in academic achievement. (Author)

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## Abstract

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# Behavior Patterns of Mildly Retarded Children in Open Classrooms[1]

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The traditional delivery system for the education of mildly retarded children (EMR) has been the self-contained classroom under the instruction of a special education teacher (Guskin & Spicker, 1968). Research on the efficacy of special class placement has been equivocal at best and has generated considerable debate concerning the effectiveness of this approach and the educational objectives for EMR children (Gallagher, 1972; Guskin & Spicker, 1968; Hammons, 1972; Lilly, 1970). Also, a great deal of discussion has centered around the possible detrimental effects of labeling EMR children in the public schools and the tendency to overassign minority group children to special classes (Gallagher, 1972; Jones, 1972; Mercer, 1971).

Recently, a number of school systems have initiated open classroom programs, modeled after the British Infant Schools, which feature the heterogeneous grouping of students by age and ability level (Kohl, 1970; Rathbone, 1971; Weber, 1971). Although there is broad variation in the practice of open education, there are definable characteristics which distinguish this approach from more traditional or formal systems (Walberg & Thomas, 1972).

One of the major goals of open education is to individualize instruction by managing the learning environment in a manner consistent with the child's interest and unique learning styles. Open educators generally espouse the Piagetian notion that young children learn best from repeated encounters with concrete experiences. Consequently, many of the

activities in open classrooms occur in an environment that is saturated with materials which are arranged in a number of small group learning centers. Since this approach stresses team teaching with multi-age groupings, the activity centers are usually arranged in a large open room or "pod".

Therefore, the assumptions and methods of open education appear to be quite different from those of more traditional systems in which the curriculum is classified by subjects, children are grouped by grades and ability, and knowledge is conveyed by prescribed texts (Walberg & Thomas, 1972). Unfortunately, there has been little systematic research on the effects of open classroom programs, aside from testimonials by exponents. Although the open classroom offers an appealing philosophical alternative to traditional special classes for educable retarded children, little knowledge is available to assist educators in implementing such programs. The purpose of the present study was to compare the classroom behavior and academic progress of mildly retarded children in two types of open classrooms, graded and multi-age, with that observed in a self-contained special education class.

## Method

Subjects. The subjects were 32 Black, EMR students in three elementary schools in Chapel Hill, North Carolina. The sample was composed of 15 boys and 17 girls. The average Wechsler IQ for the sample was 64.5 and the mean chronological age was 11.25 years. Subjects in the three schools were matched with respect to age and IQ. Twelve students were studied in three graded open classrooms (fourth, fifth and sixth grades), 10 were studied in two multi-age open classrooms (ages 9-10 and 11-12), and 10 were studied in an intermediate level special education class.

Classroom Environment. Each of the graded and multi-age classrooms contained approximately 75-90 children who were taught by teams of three teachers in a large open area. The EMR students in the two open classroom

programs were fully integrated with their peers of the same ages, while those in the special class were taught as a self-contained unit by one special education teacher. The instructional program in the graded open classroom was varied in that it incorporated individual, small-group and and large-group activities. EMR students in each graded open classroom also received additional aid from a resource teacher who worked with them as a group in the classroom. Students in the multi-age open classrooms had multiple options for activities which, unlike the children in the graded and special class programs, seldom involved large groups of children. Rather, emphasis was placed on small group and individualized instruction. Students in the special education class spent approximately one half of their time in teacher-directed large group instruction. Individual activities in the special class usually consisted of assigned seat work.

Observational Technique. In order to measure behavior patterns in each classroom setting, the Schedule for Classroom Activity Norms (SCAN)[3] was developed from the Coping Analysis Schedule for Educational Settings (CASES) devised by Spaulding (1970). According to this procedure, classroom behavior may be coded into one of 27 discrete categories every 10 seconds. In order to facilitate interpretation, the 27 categories were grouped under the general dimensions of task relevant versus task irrelevant behavior, independent versus dependent behavior, and cooperative versus aggressive behavior.

Task-relevant behavior generally refers to those activities in which the subject is engaged in an academic task or related activities which lead to a teacher accepted product or goal, e.g., attending, appropriate participation in a group activity, or conversing about an assignment. On the other hand, task-irrelevant behavior refers to activities which are inappropriate for time and place such as inattention, gross motor

movement, or conversing about things other than the assigned task.

Independent behavior refers to self-directed activities such as carrying out an assignment without direct teacher supervision, initiating conversation with a classmate, or engaging in free time pursuits, e.g., drawing and working puzzles. Self-directed behavior also includes certain non-constructive activities such as scribbling and aimlessly flipping through a book. Those behaviors which were classified as dependent or passive included seeking assistance or praise, accepting help from a teacher or peer, and passively waiting for instructions or directions.

Cooperative behaviors were scored when the child contributed to a teacher directed activity, e. g., raising one's hand to answer a question, and when the child offered information or assistance to a peer, e.g., sharing a book or helping another child with his assignment. Aggressive behavior included negative attention-getting, domination of others, resisting authority, and verbal and physical abuse.

Procedure. The behavior of each subject in the classroom was observed for a five-minute period on each of five days in the fall of 1971 and the observations were repeated four months later. Two female observers coded behavior into one of 27 categories every 10 seconds during the five minute period, which resulted in 150 observations for each child for each occasion (fall and spring). The time of the observation period was varied over the five days so that a given child was observed in different types of classroom activities and all children were observed over the same assortment of activities. The average reliability for the two observers based on 12 five-minute observation periods was 89.91 percent agreement with a range of 83.33 - 100.00 percent agreement.

In addition to the observational procedure, each child was pre-tested with the Peabody Individual Achievement Test (PIAT) in September, 1971

and was post-tested in May, 1972. The PIAT was individually administered and provided measures of reading recognition, reading comprehension, mathematics, spelling, and general information.

## Results

Classroom Behavior. The average frequency of behavior for each of the six SCAN variables is shown in Table 1 by group for the fall and spring occasions. A one-way analysis of variance was performed on the November observations for each SCAN dimension. In the fall it was found that EMR children in the graded open classrooms displayed more independent behavior than those in the other two groups ($F=3.93$, $df=2/28$, $p<.05$); however, no other comparisons were significant.

On the other hand, the analysis of variance on the spring data indicated rather marked differences among the three groups on all variables except aggression. In the spring, EMR students in the special education class showed significantly higher frequencies of task-relevant behavior ($F=6.17$, $df=2/28$, $p<.01$) and lower frequencies of task-irrelevant behavior ($F=4.90$, $df=2/28$, $p<.025$) than those in the two open classrooms. Similarly, children in the special class displayed more cooperative participation ($F=7.81$, $df=2/28$, $p<.01$) than those in the open classrooms. EMR students in the multi-age open classrooms showed relatively more independent behavior ($F=3.52$, $df=2/28$, $p<.05$) and less dependent behavior ($F=3.76$, $df=2/28$, $p<.05$) than students in the graded open and special education classes.

The analysis of change in patterns of behavior within the three types of classrooms indicated that children in graded open classes showed the greatest shift in behavior between the fall and spring measures. Significant decreases were observed for the graded open classes in task-relevant ($t=1.89$, $p<.05$) and independent ($t=4.03$, $p<.01$) behavior, and

corresponding increases were noted in task-irrelevant ($t$=2.21, $p < .05$) and dependent ($t$=3.99, $p < .01$) behavior. The frequency of behavior in each of the six categories remained remarkably stable over the fall and spring measures for the multi-age and special classes with one exception. Children in the special education class showed a significant increase in dependent behavior over the four month interval ($t$=2.16, $p < .05$). No significant sex differences in behavior were found on either occasion of measurement.

Academic Achievement. The mean fall and spring grade equivalent scores on the Peabody Individual Achievement Teat for EMR students in each type of classroom are shown in Table 2. The average gain in total achievement for the three groups was .42 years. The significance of changes in achievement between the fall and spring tests within each group was determined by $t$ tests for related samples. These comparisons revealed that all three groups made significant gains in total achievement and on the General Information and Math subtests. The graded open and special class groups showed significant gains on the Word Recognition subtest, while the graded open and multi-age open groups showed significant gains on the Reading Comprehension subtest. No significant sex differences were observed in the achievement data for any of the groups.

In order to compare relative gains in achievement among the three types of classrooms, a one-way analysis of covariance was performed on each post-test variable with the pre-test as the covariate. This analysis failed to yield significant group effects for each of the subtests and for the total score. Therefore, although the children in each setting made significant progress in academic achievement, one must conclude that the relative change in achievement was the same for EMR children in each type of classroom.

## Discussion

These results lend support to the conclusion that different instructional environments generate characteristically different patterns of classroom behavior. The task-oriented and social behavior of EMR students were similar in the two open-classrooms but very different from that observed in the self-contained special education class. An analysis of the frequency of behavior in each of the discrete categories on these dimensions generally supported the assumption that open-space, integrated classrooms facilitate greater social interaction on the part of EMR children. Therefore, this type of organizational pattern might be viewed as one alternative for breaking down the social barriers and isolation often experienced by retarded children in the special class. Unfortunately, it was not clear from these data whether this social interaction reflects the normal peer group assimilation of EMR students or whether they interact with one another to a greater degree. Hopefully, data will be obtained on these points in the near future.

A disturbing finding with respect to open classroom process was the amount of time EMR children spend in task-irrelevant behavior. While the EMR children in the self-contained class spent approximately one-half of their time in activities which lead to a teacher-accepted product, children in the open classrooms devoted only one-fourth to one-third of their time to activities centered around a specific academic task. A disproportionate amount of time in open classrooms was spent wandering around the room, waiting for instructions or attention, standing on the outside of some activity watching and conversing about things other than the assigned task. Frequently, these activities generated attendant behavior problems which required teacher intervention. Although the two open classrooms varied somewhat in this pattern, the basic problem in

both settings seemed to be one of providing adequate structure for self-directed activities. It is clear that the EMR students in the open classrooms did not take full advantage of the independent learning opportunities that the setting afforded.

On the other hand, all three groups made comparable significant gains in achievement. Therefore similar amounts of learning may have taken place regardless of these differences in behavior. The interpretation of these findings is also complicated by the fact that the EMR students who were studied in open classrooms had previous experience only in small self-contained units. It may be that the observed behavior patterns reflect a process of adjustment to the open environment rather than a stable pattern of behavior. Also, comparable data on the behavior of normal children in both settings is necessary in order to fully evaluate the generality of these effects.

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Footnotes

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[2]Requests for reprints should be sent to James D. McKinney, Frank Porter Graham Child Development Center, Highway 54 By-pass, Chapel Hill, North Carolina 27514.

[3]The SCAN observational system was developed for this study by Kathi Perkerson and Jeanne Mason..

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TABLE 1

Mean Frequency of Behavior in

SCAN Dimensions by Group and Occasion

| | Graded Open (N=12) | | Multi-Age Open (N=10) | | Special Education (N=10) | |
|---|---|---|---|---|---|---|
| | Fall | Spring | Fall | Spring | Fall | Spring |
| Task Relevant | 50.58 | 39.16 | 54.40 | 48.10 | 73.33 | 71.77 |
| Task Irrelevant | 91.58 | 105.25 | 89.30 | 96.60 | 69.33 | 74.00 |
| Independent | 76.50 | 51.91 | 67.00 | 68.40 | 51.11 | 59.33 |
| Dependent | 15.00 | 34.33 | 19.40 | 21.40 | 21.11 | 30.00 |
| Cooperative | 12.16 | 6.50 | 9.90 | 6.00 | 17.11 | 17.88 |
| Aggressive | 3.25 | 0.41 | 2.90 | 0.60 | 0.88 | 0.00 |

Note: 1971-1972

TABLE 2

Mean Pre- and Post-Test Grade Equivalent Scores

on the Peabody Individual Achievement Test

| | Graded Open (N=12) | | Multi-Age Open (N=10) | | Special Education (N=10) | |
|---|---|---|---|---|---|---|
| | Pre | Post | Pre | Post | Pre | Post |
| Math | 2.75 | 3.48 | 1.91 | 2.26 | 1.60 | 2.08 |
| Word Recognition | 2.52 | 2.85 | 2.16 | 2.29 | 1.52 | 1.94 |
| Reading Comprehension | 2.67 | 2.93 | 1.58 | 2.12 | 1.59 | 1.99 |
| Spelling | 2.62 | 3.03 | 2.61 | 2.67 | 1.91 | 2.23 |
| Information | 1.25 | 2.30 | 1.00 | 2.03 | 1.00 | 1.95 |
| Total | 2.37 | 2.85 | 1.90 | 2.22 | 1.58 | 2.01 |

Note: 1971-1972

TABLE 1

Schedule for Classroom Activity Norms

| Category | Definition | Examples | Scales |
|---|---|---|---|
| Positive Self-Assertion | Leadership toward constructive objectives. | Enforcing rules, saying, "Be quiet, do your work!" | Task relevant, Cooperative |
| Cooperation / Participation | Cooperating or participating in a teacher approved activity. | Raising hand to answer a question, sharing a book, helping a peer. | Task relevant, Cooperative |
| Task-Oriented Interaction | Working with another child on a teacher approved activity. | Working on a joint project, joint participation in a conversation about a lesson. | Task-relevant, Cooperative |
| Constructive Class Work | Self-directed activity leading to a teacher-accepted product or goal. | Doing assignment, reading, writing a paper, working. | Task-relevant, Independent |
| Constructive Play | Self-directed activity, not part of curriculum but teacher accepted. | Doing educational puzzles, games, drawing. | Task-relevant, Independent |
| Initiating Task Oriented Conversation | Task oriented interaction with peer. | Starting a conversation about school work, asking to borrow a book. | Task-relevant, Independent |
| Requesting More Work | Going beyond current task bounds. | "I'm finished--is there another sheet to do?" | Task-relevant, Dependent |
| Attending | Paying attention. | Listening carefully, watching closely. | Task-relevant |
| Work Preparation | Activity not part of task, preparing for task or cleaning up after it. Generally time wasting. | Pencil sharpening, getting ready, erasing, finding material. | Task-irrelevant, Independent |
| Gross Motor Activity | Activity involving large muscle groups, self-directed. | Running, dancing, wandering around. | Task-irrelevant, Independent |
| Non-Constructive Activity | Self-directed activity not leading to a teacher accepted goal or product. | Banging pencil on desk, scribbling, playing when work is assigned. | Task-irrelevant, Independent |
| Initiating Social Conversation | Initiating social interaction with peer that does not facilitate task relevant behavior. | Starting a conversation about after-school activity, a friend, or a party. | Task-irrelevant, Independent |
| Social Interaction | Conversing about things other than school work. | Talking about a party, planning after-school activity, talking about a friend. | Task-irrelevant |
| Inappropriate Cooperation / Participation | Interacting inappropriately. | Talking out when hands are to be raised, permitting another child to copy. | Task-irrelevant |
| Distractibility | Visual wandering, visual checking. | Looking out window, looking around, looking up when child comes near. | Task-irrelevant |
| Responding to Internal Stimuli | Not attending to teacher or peers. | Daydreaming, staring into space, scratching, stretching, yawning. | Tast-irrelevant |
| Responding passively | Waiting for directions, waiting for teacher to give directions. | Standing next to teacher without paying close attention, approaching child passively. | Task-irrelevant |
| Seeking Information | Asking for information or assistance from teacher or peers. | Asking questions, asking for help. | Dependent |
| Seeking Support or Praise | Asking for support or praise from teacher or peers. | Asking teacher to look at work or to tell if work is correct. | Dependent |
| Proximity to Teacher | Approaching or being near teacher. | Standing close to teacher, waiting for her to pay attention. | Dependent |
| Accepting Help | Accepting help in a passive way. | Passively accepting help from teacher or peer with no involvement. | Dependent |
| Resisting Authority | Active or passive resistance to authority. | Refusing to follow directions, failing to hear teacher. | Aggression |
| Negative Self-Assertion | Manipulation of others for personal gain. | Threatening, demanding, ordering. | Aggression |
| Negative Attention Getting | Using inappropriate means to get attention. | Pestering, whining, crying, clowning. | Aggression |
| Aggression Related | Verbally or physically attacking a person or object. | Destroying property, shouting, name calling, hitting, pushing. | Aggression |